

ADDRESS

Delivered by the President on Presenting the Gold Medal of the Society to Mr. Common.

GENTLEMEN,—

Your Council have awarded the Gold Medal to Mr. A. A. Common for his photographs of celestial bodies.

In this award the Council have been less influenced by originality in the methods adopted than by the great practical success which has attended Mr. Common's efforts in a most important and interesting field of astronomical research.

It appears that in 1874 Mr. Common was in possession of a five-and-a-half-inch Refractor, and was even then engaged in astronomical photography. He soon, however, found it desirable to improve his instrumental means, and provided himself with two disks of glass of seventeen inches diameter, with the intention of grinding his own mirrors, and mounting a Reflector of this size. But, fortunately perhaps for our science, Mr. Common abandoned this idea, and supplied himself with an eighteen-inch mirror by Calver. The mounting for this mirror was designed by himself and executed under his direct personal superintendence, and he was able to commence work with this powerful instrument in 1877. But even this instrument appeared insufficient to meet Mr. Common's requirements, and he soon gave an order to Mr. Calver for a mirror of three feet diameter. The first disk of this size burst into fragments under the tool, but a second disk was successfully worked, and the mirror mounted in July 1879. A description of this instrument is given in the *Memoirs*, vol. xlv. The mounting, which is quite a departure from the usual forms, shows in every direction great engineering skill, guided by the experience gained in the use of the smaller instruments of the actual requirements for successful astronomical work. The method of relieving the friction of the moving parts of the mounting by floating them in mercury, and the special adjustments for the use of the instrument for photographic purposes, are deserving of attention. This powerful instrument has been used in the observation of the fainter satellites of *Saturn* and of *Mars*, and the discovery of many new faint nebulae, but has been more especially devoted to photographic work. The first attempt at a photograph of the nebula of *Orion* was made on 1880 Jan. 20. The result was a failure. The stars were seen as

lines, and the nebula proper presented merely a faint stain upon the plate; but such failures only suggested the necessity of improved clock-driving and the use of more sensitive plates. Thus availing himself of every increase of the sensitiveness of the prepared photographic plates and continually improving the control of the driving-clock, Mr. Common was able, on 1881 June 24, to obtain a photograph of the Comet *b*, which is probably the earliest successful photograph of any comet (although a photograph of the comet was obtained on the same night by Dr. Draper); whilst on 1882 March 17, a photograph of the nebula of *Orion* was obtained, which was exhibited at the May meeting of the Society, and excited the admiration of all the astronomers who had an opportunity of inspecting it.

But still the clock-work admitted of some further improvements. It was possible to place a wire to afford a visible point of reference of the fixed direction of the instrument relatively to the stars, and thus to allow of a great extension of the time of exposure of the plates without destroying definition.

These practical improvements rendered it possible to secure the splendid photograph of the nebula which was presented to the Society in March 1883. This photograph was taken on 1883 Jan. 30.

The work has been continued, and to allow for the effects of different exposures and the sensitiveness of the plates to light of different degrees of refrangibility, a long series of experiments have been carried out with exposures increasing from 1^m to 90^m. It appears that even with the very long exposures, more details are brought out by every increase in the length of exposure, and that the extreme limit of useful exposure has not even been reached at 1^h 30^m.

With the comparatively short exposure of thirty-seven minutes, stars such as Lassell's *a* and *b* mentioned in Holden's Monograph of the central parts of the nebula in *Orion* are distinctly shown, as well as some of the faint stars discussed by Mr. Common (*Monthly Notices*, vol. xliii. p. 255); while details of the nebula itself, not represented in the best drawings that have occupied so much time and labour, and which indeed the eye can hardly discern and the hand can never properly represent, are clearly shown in the photographs. The success of these long exposures with this powerful instrument has opened out a new field of research by which the accumulating effect of the light of faint stars, too faint even for observation to the eye, have been registered upon the photographic plate. It is indeed difficult to over-estimate the interest with which the results which Mr. Common may obtain in this direction will be watched by astronomers.

In addition to the work mentioned, Mr. Common has obtained some beautiful photographs of other nebulae and of the planets *Jupiter* and *Saturn*; and has recently applied himself with success to obtaining photographic star maps to stars of the

eleventh magnitude, a field in which Professor Pickering has already made some progress.

Such, gentlemen, is a bare record of the steps which have led Mr. Common to success, and the justification of the Council in awarding to him the medal of the Society. The lesson taught is not a new one. The records of our Society are rich in the labours of our amateur astronomers. The amateur who can provide himself with sufficient instrumental means for original research need fear no professional rivalry; untrammelled by the necessity of continuing observations whose value largely depends on their continuity, having the power of taking up any subject he pleases, pursuing it so long as he believes in the possibility of success, without fear or responsibility of charges of wasted time and wasted means, he possesses advantages which are priceless in the tentative and experimental stages of any work.

It is in work of this class that the most striking advances in our science must be expected; and such work will most certainly repay, by the gratification of personal success, the efforts of those who devote themselves to original work in our science, and the field of research presented is absolutely boundless.

Mr. COMMON,

It is with the greatest pleasure that I place in your hands this medal as a recognition on the part of the Royal Astronomical Society of the great value of your contributions to the advancement of our science.

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